

Title (en)
SEMICONDUCTOR DEVICE AND FABRICATION METHOD THEREOF

Title (de)
HALBLEITERBAUELEMENT UND HERSTELLUNGSVERFAHREN DAFÜR

Title (fr)
DISPOSITIF SEMICONDUCTEUR ET PROCEDE POUR SA FABRICATION

Publication
EP 2244304 A4 20131009 (EN)

Application
EP 09710059 A 20090216

Priority
• JP 2009052560 W 20090216
• JP 2008052564 W 20080215

Abstract (en)
[origin: EP2244304A1] It is an object to provide an SGT production method capable of obtaining a structure for reducing a resistance of a gate, a desired gate length, desired source and drain configurations and a desired diameter of a pillar-shaped semiconductor. The object is achieved by a semiconductor device production method which comprises the steps of forming a pillar-shaped first-conductive-type semiconductor layer; forming a second-conductive-type semiconductor layer underneath the pillar-shaped first-conductive-type semiconductor layer; forming a gate dielectric film and a gate electrode around the pillar-shaped first-conductive-type semiconductor layer; forming a sidewall-shaped dielectric film on an upper region of a sidewall of the pillar-shaped first-conductive-type semiconductor layer and in contact with a top of the gate; forming a sidewall-shaped dielectric film on a sidewall of the gate; and forming a second-conductive-type semiconductor layer in an upper portion of the pillar-shaped first-conductive-type semiconductor layer and on the second-conductive-type semiconductor layer formed underneath the pillar-shaped first-conductive-type semiconductor layer.

IPC 8 full level
H01L 29/786 (2006.01); **H01L 21/28** (2006.01); **H01L 21/336** (2006.01)

CPC (source: EP KR)
H01L 21/28 (2013.01 - KR); **H01L 29/423** (2013.01 - KR); **H01L 29/66787** (2013.01 - EP KR); **H01L 29/78642** (2013.01 - EP KR)

Citation (search report)
• [X] DE 19746901 A1 19990506 - SIEMENS AG [DE]
• [Y] JP S6113661 A 19860121 - NIPPON TELEGRAPH & TELEPHONE
• [Y] WO 2005079182 A2 20050901 - IBM [US], et al
• [Y] US 6392271 B1 20020521 - ALAVI MOHSEN [US], et al
• [A] US 2001024858 A1 20010927 - SCHULZ THOMAS [DE], et al
• [A] JP 2004319808 A 20041111 - SHIRATO TAKEHIDE
• See references of WO 2009102062A1

Cited by
US10651180B2

Designated contracting state (EPC)
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK TR

DOCDB simple family (publication)
EP 2244304 A1 20101027; **EP 2244304 A4 20131009**; CN 101946332 A 20110112; CN 101946332 B 20120215; KR 101124137 B1 20120321; KR 20100121669 A 20101118; TW 200937536 A 20090901; TW I423344 B 20140111; WO 2009102062 A1 20090820; WO 2009110048 A1 20090911

DOCDB simple family (application)
EP 09710059 A 20090216; CN 200980105303 A 20090216; JP 2008052564 W 20080215; JP 2009052560 W 20090216; KR 20107020510 A 20090216; TW 98104439 A 20090212